The Xerces Society for Invertebrate Conservation

2015 A Year in Review

XERCES SOCIETY
for Invertebrate Conservation

Protecting the Life
That Sustains Us

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The Xerces Society for Invertebrate Conservation is an international nonprofit organization that protects wildlife through the conservation of invertebrates and their habitats. We take our name from the now extinct Xerces blue butterfly (*Glaucopsyche xerces*), the first butterfly known to go extinct in North America as a result of human activities. Since 1971, the Xerces Society has advocated for habitat protection by working with scientists, land managers, educators, and citizens on conservation and education projects.

Our core programs focus on endangered species, native pollinators, and watershed health, and the impacts of our work in these programs fall into the following categories:

- Habitat restored or protected, so that key invertebrate species have the right conditions for all life stages.
- Applied research, new understandings, and practical solutions, representing our contributions to assessing how invertebrates are faring (especially imperiled species) and our investigations into the most effective methods to restore and maintain habitat.
- People involved in invertebrate conservation around the world, whether through our trainings, citizen scientist programs, volunteer opportunities, consumer education efforts, or our publications and online resources.
- Policy interventions, such as new regulations or other protective government actions that prioritize invertebrate conservation and/or limit pesticide uses.

Highlights of our activities and impacts during 2015 are outlined on the pages that follow.

Photograph: The Xerces Society/Matthew Shepherd

Habitat

Most invertebrates face some degree of habitat loss, and so restoring lost habitat and protecting what remains are key strategies for the Xerces Society.

Creating 245,000 Acres of Wildflowers

- Since 2008, our efforts have culminated in the restoration or protection of pollinator habitat on more than 245,000 acres—with 45,000 acres in the last year alone. Our work with the USDA Natural Resources Conservation Service (NRCS) to restore pollinator habitat is paving the way for tens of thousands of additional acres of pollinator habitat in key regions.
- We increasingly recognize that lands outside of agricultural settings are important targets for habitat restoration. In 2015, the Port of Portland and the Xerces Society capped off two years of planning and site preparation by creating a 50-acre native wildflower meadow for bees on an island in the middle of the Columbia River. This site is in the flight path of the Portland International Airport, and thanks to the seed mixes we designed to support dozens of local species of bees and butterflies, it will soon provide optimal pollinator habitat. Last year, we also supervised the installation of pollinator habitat at the entry to the General Mills corporate campus in Minnesota.

Meeting the Need for Local Native Plants

- Restoring habitat for pollinators means using the native plants that are most important for priority species. As interest grows in pollinator habitat restoration, the supply of key plant species has not always kept up with the demand, especially for milkweed seed. Through Project Milkweed, our work with the native seed industry to increase the supply of this essential plant, we learned that pest control is a major issue for commercial milkweed production. Responding to this situation, we are developing a first-of-its-kind, reduced-risk IPM system for the

Habitat created as a result of Xerces efforts include meadows, roadside strips, and hedgerows. (Photograph: The Xerces Society/Jessa Kay Cruz.)

Spotlight on Monarchs: The New World of Monarch Conservation

Although we have been proponents of monarch butterfly conservation for decades, we took on an unprecedented number of monarch projects last year, thanks largely to increased federal attention on this species. In May 2015, the White House released the *National Strategy to Promote the Health of Honey Bees and Other Pollinators*, setting the stage for comprehensive approaches to protecting bees, butterflies, and other pollinators. The national strategy has three goals:

1. Adding 7 million acres of pollinator habitat;
2. Increasing monarch populations to 225 million; and
3. Reducing honey bee hive losses.

We contributed to the development of the White House strategy, and as part of our active role in the strategy's implementation, we have two main priorities. First, we are working to ensure that these opportunities lead to the creation of high-quality pollinator habitat that can be well managed for the long term. Second, we are pushing for protection and management of existing habitat that provides benefits for pollinators.

The White House strategy, coupled with the 2014 petition to list the monarch butterfly under the Endangered Species Act (submitted by the Xerces Society, a monarch biologist, and two other nonprofits), has heightened attention on monarchs. In response, federal agencies are focusing on monarchs like never before. After decades of work on monarch conservation, the Xerces Society is in a prime position to contribute a rigorous scientific approach, habitat restoration expertise, and educational experience to several cooperative efforts.

Gathering data: With heightened attention on monarchs and the habitat that has been lost, many people are eager to restore milkweed stands. However, existing habitat also needs our attention, especially in the western United States. Working with the U.S. Fish and Wildlife Service (USFWS), the Xerces Society conducted milkweed surveys on 9 USFWS refuges and 3 fish hatcheries in the summer of 2015. We collected over 1,000 new high-accuracy data points for milkweed locations. These data will be included in a joint USFWS/Xerces Society western monarch habitat suitability model. Once complete, this modeling effort will identify the specific areas of the western U.S. that are most important to monarch butterflies, in order to prioritize monarch management and restoration lands

Shaping conservation initiatives: The Xerces Society also helped develop the USDA Natural Resources Conservation Service's Monarch Butterfly Habitat Development Project to support monarch conservation on private farmlands, announced in November 2015. The initiative aims to increase monarch habitat in 10 states in the core of the monarch's migration corridor by providing additional cost share to farmers and ranchers who create high-quality habitat through multiple NRCS programs. The Xerces Society is providing guidance on regional plant species, habitat establishment, and management.

Showing people what works: Over the last year, the Xerces Society partnered with the Monarch Joint Venture and Tallgrass Prairie Center to install a series of monarch habitat demonstration sites in one of the areas that needs it most: the agricultural Midwest. The Xerces Society worked with four organic farms in Minnesota and Wisconsin to create plots of quality habitat for monarchs, providing concrete examples that pollinator conservation is an accessible, successful, and beneficial activity for farmers to undertake. We engaged Midwest farming communities surrounding our demonstration farms by hosting field days at each of the participating farms where we not only motivated farmers to take action for monarchs, but also gave them the technical information needed to make their future habitat installations succeed.

Engaging nonexperts: In 2015, we started a partnership with the Idaho Department of Fish and Game and the Washington Department of Fish and Wildlife that will involve citizen scientists in gathering data on milkweed. With our partners, we will develop and launch the western-focused Milkweed Survey, which will engage people in documenting the locations where milkweed and monarch caterpillars occur. The ultimate goal of this project will be to understand the habitats most essential to monarchs in the western U.S., so that they can be protected and managed appropriately.

management of several broadly distributed milkweed pests. Once complete, this IPM system will 1) provide the first-ever standardized methodology for estimating milkweed crop damage through formal crop scouting protocols, 2) establish recommended economic thresholds for crop damage, and 3) provide a system of recommended treatments to reduce herbivore damage while at the same time increasing protection for monarchs, crop pollinators, and predatory and parasitoid insects in milkweed seed production fields.

- Native milkweeds are not the only plants with high value to pollinators but limited commercial availability. In 2015, we continued to identify overlooked species and the barriers to increasing seed supply. We are currently working 13 native species with that help fill specific gaps. For example in California, most wildflowers bloom in the spring, leaving us few planting options for the fall. To remedy this, we have worked to bring a fall-blooming aster species that is very attractive to pollinators into production, making it more available to conservation practitioners. All of our partnerships with native seed producers have involved collection of wild seed; establishment of production plots; monitoring for seed predation, disease, and insect damage; and documentation of propagation practices.

Integrating Pollinators into Farmscapes

- In California, we are continuing to enhance two large-scale habitat demonstration projects in cropping systems for almonds and tomatoes that we previously helped plan and install. At the almond orchard, there are now a total of six hedgerows consisting of nearly 3,000 blooming shrubs and perennials, planted throughout the orchard, as well as two very large wildflower borders. Over the last year, we have helped this habitat thrive by developing irrigation and weed management plans, inter-seeding previously established wildflower areas with promising new wildflower species, and providing guidance on the replacement of plants damaged by vehicles or environmental factors. In the fall of 2015, we collaborated with the orchard staff to implement 42 acres of pollinator cover crops, designed to attract pollinators and other beneficial insects that are natural predators or parasitoids of crop pests.
- To reduce the risks associated with pesticide use in agriculture, in 2015 we hired a full-time IPM specialist. Working with the USDA and university research entomologists, our IPM specialist is developing model pest management systems for multiple crops that reduce pesticide impacts to bees. A priority project focuses on developing a pollinator reduced risk model for corn and soy, emphasizing methods for managing and reducing the impacts of neonicotinoid insecticides on bees and beneficial insects.
- Another primary initiative is the development of a model IPM system for almonds and an effort to work with some of the largest growers in California to implement reduced risk plans. This model pest management system includes habitat management for predatory insects that attack crop pests, feedback on the risks of insecticides currently in use, research from the University of California on the use of organic alternatives, and exploration of non-chemical control strategies such as mating-disruption pheromones of key pests. Working with the growers, we are documenting the efficacy of these pest management practices and developing model recommendations that can be shared with the almond industry.

Science

Conservation efforts have to be informed by accurate assessments of how a species is faring and how well specific methods of protecting habitat work. When grounded in research, conservation needs can be more easily prioritized and communicated credibly to policy makers. Scientific approaches also verify which on-the-ground methods are most effective when it comes to habitat restoration.

Understanding How Invertebrates Are Doing

- Since 2011, the Migratory Dragonfly Partnership has combined research, citizen science, education, and outreach to better understand North America's migrating dragonflies, and to promote conservation of their wetland habitats. As the project's coordinator, the Xerces Society is helping a network of dragonfly experts and enthusiasts build a collective understanding of the flight paths of migratory dragonflies and the timing and intensity of their annual flights in different parts of the continent.
- Over the last 6 years we have worked with the Forest Service/Bureau of Land Management Special Status and Sensitive Species Program to provide information that helps these agencies prioritize conservation projects. We have assessed the status, conducted surveys, and developed technical guidance on over 200 invertebrate species, and in 2015, our work with this program encompassed caddisflies, stoneflies, freshwater mussels, butterflies, tiger beetles, and the Malone's jumping slug.

Assessing Current Risks

- Building on our work to assess the status of all 46 North American bumble bee species according to the International Union for Conservation of Nature's Red List Criteria, our attention turned to Central and South America. In the spring of 2015, the Xerces Society organized and delivered a bumble bee workshop in Chiapas, Mexico, to train participants in the International Union for Conservation of Nature (IUCN) Bumblebee

Species monitoring and research took Xerces high into the North Cascades of Washington and thigh-deep into urban streams of Portland, Oregon. (Photographs: left, The Xerces Society/Candace Fallon; right, The Xerces Society/Michele Blackburn.)

Specialist Group in applying the Red List Categories and Criteria to bumble bee fauna in the remainder of the western hemisphere.

- Freshwater mussels in the western United States are declining. These animals have immense ecological significance, thanks to their ability to improve water quality, as well as significant importance in many Native American cultures. Our work emphasizes four target species/clades that face extinction risk. In 2015, we shared our estimates of the changes in the extent of occurrence across each species' range between historic and recent time periods with state wildlife agencies throughout the West. Ten western states committed to including at least one species of freshwater mussel on their list of Species of Greatest Conservation Need; once mussels are included on these lists, projects targeting the restoration of their habitats can be funded. Our work is also helping to clarify the taxonomy of several floater species; based on our work in 2015, we will propose subspecies names for six genetically distinct populations of *Anodonta nuttalliana* in the western U.S. in 2016.

Undertaking Applied Research to Inform Habitat Restoration

- In order to advance the science of habitat restoration for pollinators, we are furthering our understanding of how to manage restoration sites through continued monitoring of restored wildflower habitat on or adjacent to agricultural lands. With our partners at the NRCS Plant Materials Centers, we continued to test pollinator seed mixes. Our goal is to develop regionally specific mixes that will thrive in local conditions and provide blooms throughout the growing season.

Investing in the Future of Lepidoptera Conservation

- Each year, the Xerces Society selects two recipients for the Joan Mosenthal DeWind Award. These awards are given to individuals engaged in studies or research leading to a university degree related to Lepidoptera research and conservation, and working or intending to work in that field. Joan was a pioneering member of the Xerces Society, an avid butterfly gardener, and an accomplished amateur lepidopterist. Her contributions of time, organizational expertise, and financial support were essential to the growth and success of the Xerces Society over the past 40 years. In Joan's memory, Bill DeWind established a student research endowment fund in her name. Winners in 2015 were Ania Majewska, from the University of Georgia, for her research on the effects of tropical milkweed on monarch migration and disease, and Joseph Smokey, from Washington State University Vancouver, School of Biological Science, for his evaluation of the impact of burning as a restoration method of remnant prairie habitat on the federally endangered Fender's blue butterfly.

People

The Xerces Society builds the base of invertebrate allies by working with several audiences (farmers, agency personnel, gardeners, and nature lovers) to spread the word about the importance of invertebrates and their habitat needs, as well as to convey concrete steps that people can take to protect these animals. Our reach is increasingly international, thanks to our online presence and to several partnerships that have taken our staff to other countries.

Training and Educating Invertebrate Conservationists

- Since 2008, through "bee-safe farming" workshops, farm field days, pollinator conservation and conservation biocontrol short courses, webinars, presentations at conferences, and other events, we have reached over 62,000 agricultural professionals and other interested audiences in all 50 states, as well as researchers and rural development professionals in India and Europe. During 2015, our pollinator conservation team reached over 11,000 people.
- In 2015, we launched a new series of short courses on conservation biological control—a science-based pest management strategy that seeks to integrate beneficial insects back into cropping systems for natural pest control. Modeled on our successful Pollinator Conservation Short Course and tailored to the needs of farmers and agricultural support staff, this course includes modules on beneficial insect biology, habitat design for beneficials, pesticide risk mitigation, financial support available through USDA programs, and real-world case studies. We delivered the course four times (in Iowa, Minnesota, Rhode Island, and Wisconsin) last year, and we have been funded to take the course nationwide by 2018.
- In 2015, we presented six bumble bee conservation short courses in West Coast states to 150 members of the public, land managers, and agency biologists, with information about bumble bee identification, biology, ecol-

During 2015, many thousands of people attended short courses or other events presented by Xerces staff, building a nationwide community of informed and active conservationists. (Photograph: Pam Herou.)

ogy, conservation status, threats, conservation needs, and steps that individuals can take to conserve bumble bees.

- From 2012 through 2015, we reached at least 3,500 people directly through more than 55 workshops and presentations about the Migratory Dragonfly Partnership given across the USA and in Canada. These events were attended by the public, members of environmental education programs (Master Naturalists, Master Gardeners), and staff of federal, state, and regional natural resource agencies.
- In addition to the bumble bee workshop in Chiapas, Mexico, for the IUCN Bumblebee Specialist Group, we also participated in the meeting of the IUCN in Abu Dhabi where 150 representatives from across the world came together to share ideas and wisdom on how we can address the global decline in species. At the meeting we shared out work regarding global conservation efforts for bumble bees and butterflies.

Enlisting Citizen Scientists and Backyard Conservationists

- By the end of 2015, more than 1,000 registered users had reported 10,000 dragonfly observations on the Migratory Dragonfly Partnership (MDP) website, representing a 44% increase in participation since 2014.
- MDP citizen scientists and other interested dragonfly enthusiasts are now able to identify and find dragonflies in their area with the release of the new Dragonfly ID app. Dragonfly ID is increasing volunteer interest in MDP programs and is elevating MDP's reach to new audiences in the naturalist community. Since the app's launch in September 2015, more than 2,200 people have downloaded it.
- To date, over 4,700 people have pledged to install or protect over 59,000 acres of habitat for the benefit of pollinators. By taking the Bring Back the Pollinators Pledge, these individuals have committed to providing flowers, nesting habitat and eliminating pesticides in their yards, gardens, farms, or in nearby natural areas or public spaces.
- For a second year, we organized volunteers in Portland, Oregon, to monitor the survival of freshwater mussels that had been rescued prior to a restoration project that involved dewatering a stream. Second-year surveys showed that 96% of mussels survived, similar to 2014's results, which had a 95% survival rate.
- Bumble Bee Watch (www.bumblebeewatch.org), a citizen science program launched in 2014 to track and conserve North America's native bumble bees, now has documentation of more than 9,100 confirmed sightings of bumble bees. The Xerces Society partners with several other collaborators on this project.
- In 2015 we launched a new online tool to support the Western Monarch Thanksgiving Count, a yearly effort of volunteer citizen monitors to collect data on the status of monarch populations overwintering along the California coast. Using the new Western Monarch Count Resource Center, citizen scientists can access the latest information on helping understand monarchs in the west. Volunteers visited 187 monarch overwintering sites in 2015 and counted 271,924 monarchs.

Releasing New Resources and Publications

- The Xerces Society is increasingly focusing on the conservation opportunities presented by roadsides, which can connect otherwise isolated patches of pollinator habitat and create habitat corridors, and in 2015, we developed new publications and resource materials on this topic. In collaboration with environmental consultants at ICF International, the Xerces Society prepared a report titled *Literature Review: Pollinator Habitat Enhancement and Best Management Practices in Highway Rights-of-Way* for the Federal Highway Administration (FHWA), which was released in May 2015. The literature review addresses the importance of and decline in pollinators, the threats to pollinators associated with roads, restoration and vegetation management for pollinators, and includes case studies of successful roadside management. This guide will inform restoration and management not only by FHWA but also by state and local transportation departments across the U.S. The literature review is the foundation for best management practices that will be published in 2016.

- Not all of our roadsides materials are for agency personnel, however. Working directly with the Iowa Department of Transportation's Living Roadways Trust Fund, we developed a poster on monarch butterflies and how the milkweed they depend on can be part of roadside habitat. This poster is the first in a series of four that we will complete, along with a booklet about beneficial insects, roadside habitat, and habitat restoration, in 2016.
- We published several groundbreaking conservation guides and scientific reports, including the updated fourth edition of *Farming for Bees*, as well as new publications such as *Milkweeds and Monarchs in the Western U.S.* and *Native Freshwater Mussels in the Pacific Northwest: Stewardship and Environmental Education for Community-based Organizations*.

Policy

Every level of government—federal, state, or local—has the ability to guide invertebrate conservation, and at the Xerces Society, we see government agencies as necessary partners in our work. We seek to collaborate whenever possible, but when necessary, we aren't afraid to ask government agencies to step up and fulfill their responsibilities to protect animals and their habitats. (Note: No foundation funding is used for lobbying purposes.)

Advocating for Legal Protections for Invertebrates

- In response to a Xerces Society petition, on September 30, 2015, the U.S. Fish and Wildlife (USFWS) proposed that seven species of Hawaiian yellow-faced bees be listed as endangered. When the proposed rule is finalized, these will be the first bees to gain federal protection in the United States. Earlier that month, the U.S. Fish and Wildlife Service also issued a positive 90-day finding for the rusty patched bumble bee, which has been lost from 87% of its historic range. The USFWS determined that protection under the Endangered Species Act may be warranted and initiated a status review of the species. This action was in response to a petition authored and submitted by the Xerces Society and prominent bumble bee biologists in 2013, and a subsequent lawsuit filed by the Xerces Society in 2014.
- In 2015, we leveraged a key opportunity to make changes to state policies and programs that will bring greater attention to endangered pollinators and increase public funding for their protection. Every ten years, each U.S. state adopts a State Wildlife Action Plan, the guiding document used by state agencies to establish wildlife conservation priorities. Many of these plans were due for renewal in 2015. We provided information to numerous states, and many of them made changes to their plans: 25 states will include imperiled bumble bees, 42 states will include dragonflies, and 10 states will include freshwater mussels in their lists of Species of Greatest Conservation Need. Once a species has this designation, federal and state agencies can award conservation grants for projects that help protect them.
- Oregon Department of Agriculture finalized a rule in 2015 to restrict the release of farmed monarchs in Oregon, as a direct result of our advocacy

Linking Pesticides Research and Policy Change

- The Xerces Society continues to maintain regular communication with federal decision makers including staff at the White House's Office of Science and Technology Policy as well as the EPA's Office of Pesticide Programs, and responds to key opportunities for public comment. In May 2015, when the EPA initiated a public comment period on pesticides and pollinators, the Xerces Society submitted substantive comments and provided other organizations with the technical background needed to submit their own comments. Some of this federal advocacy work is already paying off. For example, the EPA recently accelerated the neonicotinoid review processes, promising to have them completed by 2017. Furthermore, the EPA also promised to correct the excessive use rates currently allowed for household products.

Supporting Pesticide Limits Throughout the Country

- In the past year, we have assisted dozens of community members and local government staff, in their efforts to protect pollinators from highly toxic, long-lived systemic insecticides. In total, since we started working on local policy change in 2014, the Xerces Society has assisted in policy enactment related to neonicotinoids in ten cities and counties. In some of these communities, the Xerces Society's staff helped craft the policies and actively worked for their passage. In other cases, local decision makers and activists used our materials to move their efforts forward. In every instance, we provided scientific information as well as other technical assistance

Xerces scientists worked with communities to advocate for reduced pesticide use. (Photograph: The Xerces Society/Margo Conner.)

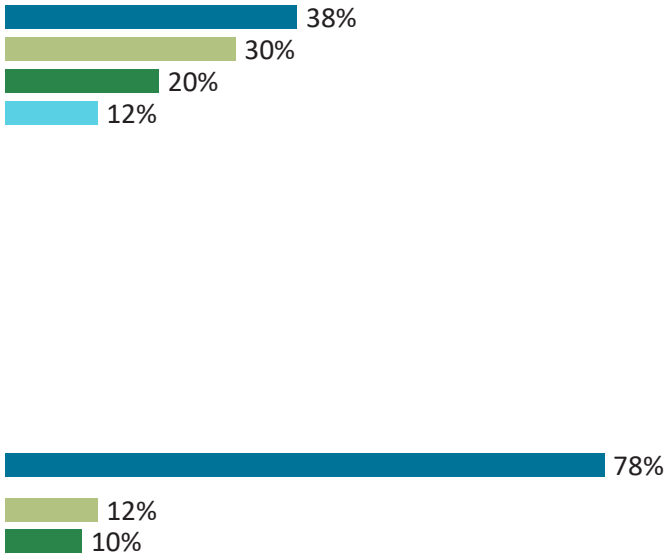
to activists, organizations and decision makers in their efforts to protect pollinators from pesticides. We are also encouraging communities to think beyond neonicotinoids, with two notable successes. Reno, Nevada, has now stopped using all pesticides in 13 parks, and we provided Boulder County, Colorado, with the information it needed to develop a plan to provide habitat for pollinators and limit pesticide use.

- We also lead a successful effort to prompt the State of Oregon to prohibit all uses of clothianidin, dinotefuran, imidacloprid, and thiamethoxam on linden trees (*Tilia* spp.). Beginning in June 2014, we helped ensure that Oregon took strong actions to avoid any further acute bumble bee poisonings after neonicotinoids are used on Tilia trees. On February 27, 2015, in the face of industry opposition, the Oregon Department of Agriculture finalized the rule that prohibits this use. When we reached out to Oregon Department of Agriculture staff to thank them for the new rule we received the response: "You were the one who made the recommendation in the report, so you also played a large role." This new rule will go a long way to prevent future mass die-offs of native bumble bees.
- Working in tandem with a large group of stakeholders, the Xerces Society successfully prevented the application of the long-lived, highly toxic chemical imidacloprid in Willapa Bay and Grays Harbor, two ecologically diverse estuaries located on the Pacific coast of Washington. Faced with vocal opposition from consumers, chefs, and oyster and clam buyers, in May 2015 the Willapa–Grays Harbor Oyster Growers Association withdrew its application to apply pesticides.
- In response to an EPA mandate, many states are creating pollinator protection plans. As a result, the Xerces Society wrote a summary set of recommendations for states to use when creating these plans. In August 2015, we sent our recommendations to key staff at over 30 state agriculture departments as well as to many of our partner organizations across the country. We have also been asked by a number of state agencies to participate in the creation of their state plans, and are currently engaged in the planning processes of California, Indiana, Oregon, Washington, and Wisconsin.
- As a founding and guiding member of a pollinator protection network representing diverse organizations and businesses, we wrote a comprehensive letter to the White House Task Force on Pollinator Health that summarized recommendations to protect pollinators from neonicotinoids and other similar chemicals. Not only did that letter galvanize support from 128 organizations and garner significant media attention, it also has served as a template for numerous other letters submitted to the federal government from the network.

2015 Financial Report

Financial Activities January to December 2015 (Audited)

REVENUE	
Foundation & corporate giving	$1,457,563
Government contracts	1,153,779
Individual donations	754,174
Program revenue & publications	447,872
Net other revenue & unrealized gain	3,008
Total revenue	**$3,816,396**
EXPENSES	
Programs	
Pollinator conservation	$1,676,181
Endangered species	466,891
Aquatic conservation	226,451
Other conservation	97,694
Total programs	***$2,467,217***
Development & membership	394,879
Management & general	321,191
Total expenses	**$3,183,287**
Net income	***$633,109***



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